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FACSIMILE COVER SHEET

DATE: May 5, 2009
FILE NO: ROC920000051US2 (1032.012185 (IBM2K0051.D1))
TO: Examiner Ben C. Wang
FAX NO: 1-571-270-2240
FROM: Gero G. McClellan / Johnny Lam
PAGE(S) with cover: 12

RE:

TITLE: DEBUGGING METHODS FOR HEAP MISUSE
U.S. SERIAL NO.: 10/661,982
FILING DATE: September 12, 2003
INVENTOR(S): Bates et al.
EXAMINER: Ben C. Wang
GROUP ART UNIT: 2192
CONFIRMATION NO.: 9327

Attached are the following document(s) for the above-referenced application:

Interview Request Form

Copy of Response to Office Action filed May 4, 2009

CONFIDENTIALITY NOTE

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PTOL-413A (10-07)
 Approved for use through 10/31/2007. OMB 0651-0031
 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Applicant Initiated Interview Request Form

Application No.: 10/661,982 First Named Applicant: Cary L. Bates
 Examiner: Ben C. Wang Art Unit: 2192 Status of Application: Pending

Tentative Participants:

(1) Gero McClellan (2) Ben C. Wang
 (3) Johnny Lam (4) _____

Proposed Date of Interview: May 20, 2009 Proposed Time: 4pm (AM/PM)

Type of Interview Requested:

(1) ☒ Telephonic (2) ☐ Personal (3) ☐ Video Conference

Exhibit To Be Shown or Demonstrated: ☐ YES ☒ NO

If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) <u>112 rej.</u>	<u>1-13</u>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) <u>102 rej.</u>	<u>1-8,11-13</u>	<u>Spertus</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) <u>103 rej.</u>	<u>9-10</u>	<u>Spertus, Kowal</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Continuation Sheet Attached

Brief Description of Arguments to be Presented:

Applicants wish to discuss the applicability of the references to the present claims, as characterized by the Examiner's Action. Further, Applicants wish to discuss proposed amendments to the claims.

An interview was conducted on the above-identified application on _____.

NOTE:

This form should be completed by applicant and submitted to the examiner in advance of the interview (see MPEP §713.01).

This application will not be delayed from issue because of applicant's failure to submit a written record of this interview. Therefore, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible.

/Gero G. MCCLELLAN, Reg. #44227/

Applicant/Applicant's Representative Signature

Examiner/SPE Signature

Gero G. McClellan

Typed/Printed Name of Applicant or Representative

44227

Registration Number, if applicable

PATENT
App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC920000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Bates et al.

Serial No.: 10/661,982

Confirmation No.: 9327

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Filed: September 12, 2003

Group Art Unit: 2192

Examiner: Ben C. Wang

For: DEBUGGING METHODS FOR HEAP MISUSE

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or facsimile transmitted to the U.S. Patent and Trademark Office to fax number 571-273-8300 to the attention of Examiner Ben C. Wang, or electronically transmitted via EFS-Web, on the date shown below:

May 4, 2009
Date

/Mayra Bravo/
Mayra Bravo

RESPONSE TO OFFICE ACTION DATED FEBRUARY 4, 2009

In response to the Office Action dated February 4, 2009, having a shortened statutory period for response set to expire on May 4, 2009, please enter this response and reconsider the claims pending in the application for reasons discussed below. While no fees are believed due, the Commissioner is hereby authorized to charge counsel's Deposit Account No. 09-0465 / ROC920000051US2 for any fees, including extension of time fees or excess claim fees, required to make this response timely and acceptable to the Office.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper. Remarks/Arguments begin on page 8 of this paper.

PATENT
App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC920000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

IN THE CLAIMS:

Please cancel claims 5, and amend the claims as follows:

1. (Currently Amended) A computer-implemented method for managing memory available for dynamic allocation during execution of code containing a plurality of memory allocators and a plurality of memory deallocators, comprising:

providing a computer user interface;

allowing a user to establish, via the computer user interface, a relationship between one or more of the memory deallocators and one or more of the memory allocators, wherein the relationship requires that memory space allocated by the one or more allocators is freed by the one or more deallocators and wherein the relationship is represented by a data structure containing a reference to the one or more of the memory deallocators and the one or more of the memory allocators;

allowing the code to execute;

upon a call to the one or more deallocators to free a memory space, determining whether the relationship is violated, wherein determining whether the relationship is violated comprises determining that the memory space was allocated by an allocator different from the one or more memory allocators; and

if so, notifying the user.

2. (Original) The method of claim 1, wherein notifying the user comprises halting execution of the code.

3. (Original) The method of claim 1, wherein notifying the user comprises halting execution of the code and displaying a status message to the user.

4. (Original) The method of claim 1, if the relationship is not violated, freeing the memory space.

PATENT
App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC92000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

5. (Cancelled)

6. (Currently Amended) A computer-implemented method for managing memory available for dynamic allocation during execution of code containing a plurality of memory allocators and a plurality of memory deallocators, comprising:

establishing a relationship between a user-selected memory deallocator and a user-selected memory allocator, wherein the relationship requires that memory space freed by the user-selected deallocator have been allocated by the user-selected allocator, and wherein the relationship is represented by a data structure containing a reference to the user-selected deallocator and the user-selected allocator, and wherein the relationship is violated upon determining that the memory space freed by the user-selected deallocator was allocated by an allocator different from the user-selected allocator;

allowing the code to execute;

upon a call to the user-selected deallocator to free a memory space, determining whether the memory space was allocated by the user-selected allocator; and

if so not, notifying the user that the relationship is violated.

7. (Original) The method of claim 6, wherein notifying the user comprises halting execution of the code and displaying a status message to the user.

8. (Previously Presented) A method for managing memory available for dynamic allocation during execution of code containing a plurality of memory allocators and a plurality of memory deallocators, comprising:

setting an upper limit on the amount of memory space an allocator can allocate during execution of the code, wherein the upper limit is specific to the allocator; wherein the upper limit and a reference to the allocator are stored in a data structure, thereby relating the upper limit to the allocator;

during execution of the code, tracking the amount of memory space allocated by the allocator; and

PATENT

App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC920000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

when the amount of memory space allocated exceeds the limit, notifying a user.

9. (Original) The method of claim 8, wherein the step of tracking comprises: determining whether the allocator is called to allocate memory and, if so, incrementing a counter; and

determining whether a deallocator is called to deallocate memory allocated by the allocator and, if so, decrementing the counter.

10. (Original) The method of claim 8, wherein the step of tracking comprises incrementing a counter in the event of memory allocation by the allocator and decrementing the counter in the event of memory deallocation of memory space allocated by the allocator.

11. (Original) The method of claim 8, wherein notifying the user comprises halting execution of the code.

12. (Original) The method of claim 8, wherein the upper limit is independent of other memory size limitations.

13. (Original) The method of claim 8, wherein the upper limit is not a limit on a stack size.

14-22. (Canceled)

Please add the following new claims:

23. (New) A computer readable storage medium containing a program which, when executed, performs an operation for managing memory available for dynamic allocation

PATENT
App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC920000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

during execution of code containing a plurality of memory allocators and a plurality of memory deallocators, the operation comprising:

- establishing a relationship between a user-selected memory deallocator and a user-selected memory allocator, wherein the relationship is represented by a data structure containing a reference to the user-selected deallocator and the user-selected allocator, and wherein the relationship requires that memory space freed by the user-selected deallocator have been allocated by the user-selected allocator;

- allowing the code to execute;

- upon a call to the user-selected deallocator to free a memory space, determining whether the memory space was allocated by the user-selected allocator; and

- if so, notifying the user that the relationship is violated.

24. (New) The computer readable storage medium of claim 23, wherein notifying the user comprises halting execution of the code and displaying a status message to the user.

25. (New) A computer readable storage medium containing a program which, when executed, performs an operation for managing memory available for dynamic allocation during execution of code containing a plurality of memory allocators and a plurality of memory deallocators, the operation comprising:

- setting an upper limit on the amount of memory space an allocator can allocate during execution of the code, wherein the upper limit is specific to the allocator;

- during execution of the code, tracking the amount of memory space allocated by the allocator; and

- when the amount of memory space allocated exceeds the limit, notifying a user.

26. (New) The computer readable storage medium of claim 25, wherein the step of tracking comprises:

- determining whether the allocator is called to allocate memory and, if so, incrementing a counter; and

PATENT
App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC920000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

determining whether a deallocator is called to deallocate memory allocated by the allocator and, if so, decrementing the counter.

27. (New) The computer readable storage medium of claim 25, wherein the step of tracking comprises incrementing a counter in the event of memory allocation by the allocator and decrementing the counter in the event of memory deallocation of memory space allocated by the allocator.

28. (New) The computer readable storage medium of claim 25, wherein notifying the user comprises halting execution of the code.

29. (New) The computer readable storage medium of claim 25, wherein the upper limit is independent of other memory size limitations.

30. (New) The computer readable storage medium of claim 25, wherein the upper limit is not a limit on a stack size.

31. (New) A computer system comprising an output device, a memory device, one or more processors, code resident in the memory device and containing a plurality of memory allocator calls and a plurality of memory deallocator calls, a heap manager resident in the memory device to allocate and free memory of the memory device and a debugger program resident in the memory device; the debugger program comprising a debugger user interface configured to at least:

allow a user to view allocation/deallocation history information at a user-specified memory location; and

allow a user to establish a relationship between a memory deallocator call and a memory allocator call, wherein the relationship is represented by a data structure containing a reference to the user-selected deallocator and the user-selected allocator, and wherein the relationship requires that memory space allocated by the memory

PATENT
App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC920000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

allocator call is freed by the memory deallocator call and a violation of the requirement causes the debugger user interface to notify the user.

PATENT
App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC920000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

REMARKS

This is intended as a full and complete response to the Office Action dated February 4, 2009, having a shortened statutory period for response set to expire on May 4, 2009. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-13 are pending in the application. Claims 1-4, 6-13 and 23-31 remain pending following entry of this response. Claims 1 and 6 have been amended. Claim 5 has been cancelled. New claims 23-31 have been added to recite aspects of the invention. Applicants submit that the amendments and new claims do not introduce new matter.

Further, Applicants are not conceding in this application that those amended (or canceled) claims are not patentable over the art cited by the Examiner, as the present claim amendments and cancellations are only for facilitating expeditious prosecution of the claimed subject matter. Applicants respectfully reserve the right to pursue these (pre-amended or canceled claims) and other claims in one or more continuations and/or divisional patent applications.

Claim Rejections - 35 U.S.C. § 112

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With this response, Applicants have amended claim 1 to recite "wherein determining whether the relationship is violated comprises determining that the memory space was allocated by an allocator different from the one or more memory allocators." Further, claim 6 has been amended to recite similar limitations. Applicants submit that the claims, as amended, are not indefinite. Accordingly, Applicants respectfully submit that the rejection is obviated.

PATENT
App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC920000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

Claim Rejections - 35 U.S.C. § 102

Claims 1-8 and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by *Spertus et al.*, U.S. Patent No. 6,938,245 B1 (hereinafter *Spertus*).

With this response, Applicants have amended claim 1 to recite "wherein determining whether the relationship is violated comprises determining that the memory space was allocated by an allocator different from the one or more memory allocators." Further, claim 6 has been amended to recite similar limitations. Applicants submit that the claims, as amended, are not taught by *Spertus*. Accordingly, Applicants respectfully submit that the rejection is obviated.

Therefore, the claims are believed to be allowable, and allowance of the claims is respectfully requested.

Claim Rejections - 35 U.S.C. § 103

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Spertus* in view of *Kolawa et al.*, U.S. Patent No. 5,842,019 (hereinafter *Kolawa*).

With this response, Applicants have amended claim 1 to recite "wherein determining whether the relationship is violated comprises determining that the memory space was allocated by an allocator different from the one or more memory allocators." Further, claim 6 has been amended to recite similar limitations. Applicants submit that the claims, as amended, are not taught by the references. Accordingly, Applicants respectfully submit that the rejection is obviated.

Therefore, the claims are believed to be allowable, and allowance of the claims is respectfully requested.

PATENT
App. Ser. No.: 10/661,982
Atty. Dkt. No. ROC920000051US2
PS Ref. No.: 1032.012185 (IBM2K0051.D1)

Conclusion

Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted, and
S-signed pursuant to 37 CFR 1.4,

/Gero G. MCCLELLAN, Reg. #44227/

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